Isom, Debra A (Debbi)

From: Tortoso, Arlene C
Sent: Monday, February 04, 2002 3:12 PM
To: Isom, Debra A (Debbi)
Subject: FW: Responses To Ecology Comments

Debbi:
Please add the email below and the attached file with comment responses to the administrative record for 200-UP-1. If you have any questions, please let me know.
Thanks,

Arlene Tortoso
DOE-RL-WMD
(509) 373-9631

-----Original Message-----
From: Byrnes, Mark E
Sent: Monday, February 04, 2002 3:07 PM
To: Jackson, Zelma; Price, John (ECY)
Cc: Tortoso, Arlene C; Borghese, Jane V
Subject: Responses To Ecology Comments

Zelma and John:

Thank you for taking the time to review BHI-01576, Draft A, *DQO Summary Report for Establishing a 200-ZP-1 and 200-UP-1 Groundwater Monitoring Well Network* and for sitting down with me to be certain I clearly understood the comments prior to making changes. The attached file is a copy of your original set of comments along with responses detailing how the document was modified to address each comment. Please do not hesitate to call me at 372-9267 if you have any questions.

Sincerely,

Mark Byrnes

Ecology Comments and Response ...

Comments on "DQO Summary Report for Establishing a 200-ZP-1 and 200-UP-1 Groundwater Monitoring well Network

General Comments:

The DQO Summary Report focuses on a path forward for work breakdown between the ERC program's groundwater remediation performance monitoring program and PNNL's Site-wide surveillance monitoring program. The emphasis of the DQO should be on fulfilling requirements for regulatory compliance and technical sufficiency. The monitoring program should clearly identify its objectives in terms of whether it is research, detection, compliance, ambient or a combination of these objectives.

All references to the ERC program and PNNL have been removed from the document with the exception that PNNL is cited as the developer of the geostatistical software used to support this DQO. Section 1.1 identifies the specific objectives of the remediation performance monitoring and site-wide surveillance monitoring.

The DQO Summary Report should provide a contingency plan for well placement in order to meet the 200-UP-1 ROD. The document does not address issues of the 200-UP-1 monitoring network design and its impact. From 1995 to 1997 the extraction groundwater was treated at site and the treated water was injected in an up-gradient injection well. During 1997 it was decided to transfer the contaminated groundwater to ETF for treatment which would result in lower cost and higher treatment efficiency. This remedial action resulted in a modified capture zone for UP-1 causing dry observation monitoring wells for both Technitium-99 and Uranium. The efficiency of ETF and its impact to the network design was not mentioned as a project issue, and will not be taken in consideration during the DQO.

The final 200-UP-1 groundwater monitoring network has been expanded to include the option of installing three "contingency monitoring wells" in the vicinity of U Plant. These wells would be installed if the boundaries of the Tc-99 and Uranium plumes are determined at a later date to need further refinement, or if one or more of the network wells in the vicinity of U Plant go dry in the future. The Description of Work that will be prepared prior to the installation of new groundwater monitoring wells shall specify where screened intervals shall be set. This depth shall take into consideration the projected pumping rates for groundwater extraction wells as well as other factors affecting declining water levels.

The extraction well has been pumping less than 50 gpm to capture the COC plumes. Although an assessment of pumping rates, locations and modifications

of capture is beyond the scope of this DQO, the DQO does need to recognize those as external influences that have to be considered in the DQO.

The Description of Work that will be prepared prior to the installation of new groundwater monitoring wells shall specify where screened intervals shall be set. This shall take into consideration the estimated groundwater elevation associated with the maximum projected pumping rates from the extraction wells.

The design of the groundwater-monitoring network is a complex problem; however, the question to be answered by the DQO should be either to measure ground water level or the COCs (primary and secondary) or both.

The first bullet in Section 1.2 Project Assumptions, has been expanded as follows: "The groundwater monitoring network resulting from this DQO process shall be used to address both the groundwater remediation performance monitoring (CERCLA monitoring) and Site-wide surveillance monitoring requirements (monitoring required to meet DOE orders) for the 200-ZP-1 and 200-UP-1 OUs. This includes both the surveillance monitoring of contaminants in groundwater, as well as the monitoring of groundwater elevations.

The document does not address the use of the conceptual geochemical model for uranium transport as it relates to UP-1.

No geochemical modeling was performed to support this effort. Rather geostatistical modeling was used to select the most appropriate set of wells to be included in the groundwater monitoring network. Details on the geostatistical modeling performed are presented in Section 7.1 of the DQO. Historical groundwater analytical data was used to observe general migration of contaminants over time as opposed to predicting this migration using geochemical models.

Specific Comments:

Section 1.0, page 1-1, paragraph 1
The parenthetical of the contractor-regulation relationship should be reversed:

> "*Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) monitoring (by the Environmental Restoration Contractor – ERC) and Hanford Site-wide monitoring programs to meet the requirements of U.S. Department of Energy (DOE) orders (by Pacific Northwest National Laboratory)."

Paragraph has been rewritten as follows: "The purpose of this data quality objective (DQO) process is to assess the current groundwater monitoring well network at the 200-ZP1 and 200-UP-1 Operable Units (OUs). This

assessment is needed to address changing contaminant plume conditions (e.g., plume migration) and to ensure that monitoring activities meet the requirements for remediation performance monitoring (i.e., *Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended* [CERCLA] monitoring) and Site-wide surveillance monitoring to meet the requirements of U.S. Department of Energy [DOE] orders. This DQO was prepared in response to the CERCA five-year review of groundwater remedial actions at the Hanford Site, and it supports Action Items 200-3 and 200-6."

Section 1.0, page 1-1, paragraph 1
Describe the changing contaminant plume conditions. A major element affecting pump-and-treat system design is the characterization of the groundwater flow.

Clarified text to read "...changing contaminant plume conditions (e.g., plume migration) ...". While the pump-and-treat design is outside of the scope of this DQO, the resulting groundwater monitoring network will allow the collection of reliable groundwater elevation measurements which can then be contoured to accurately define groundwater flow directions.

Section 1.1, page 1-1, paragraph 1
Demphasize the objective of the project as meeting the needs of PNNL and the ERC monitoring programs and instead emphasize compliance monitoring as it relates to the ROD for 200-UP-1. Plume shape and internal structure is controlled by spatial distribution of mass in source area, composition and solubility, source zone hydraulics and variable flow rates and attenuation processes in dissolved plumes. Dissolved plumes vary in space and time and rarely is there steady state.

All references to the ERC program and PNNL have been removed from the document with the exception that PNNL is cited as the developer of the geostatistical software used to support this DQO.

Paragraph has been rewritten as follows: "The purpose of this data quality objective (DQO) process is to assess the current groundwater monitoring well network at the 200-ZP1 and 200-UP-1 Operable Units (OUs). This assessment is needed to address changing contaminant plume conditions (e.g., plume migration) and to ensure that monitoring activities meet the requirements for remediation performance monitoring (i.e., *Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended* [CERCLA] monitoring) and Site-wide surveillance monitoring to meet the requirements of U.S. Department of Energy [DOE] orders. This DQO was prepared in response to the CERCA five-year review of groundwater remedial actions at the Hanford Site, and it supports Action Items 200-3 and 200-6."

Section 1.1, page 1-1, paragraph 2
State whether a DQO concept behind co-mingling efforts of ERC ground water level observation network and the PNNL ground water quality monitoring network is to take advantages of similarity in cost or design.

Since this document is being prepared as a joint effort, all references to the ERC program and PNNL have been removed from the document except when citing PNNL's geostatistical modeling software. The sampling program resulting from this DQO will meet all of the requirements of both programs with no duplication of effort.

Section 1.2, page 1-2, Bullet 4
Is the statistical approach simulation, variance or probability-based?

The geostatistical approach developed by PNNL is based on Stochastic simulation. Text on Page 1-2 and 7-1 states this.

Section 1.2, page 1-2, Bullet 6
Begs the question: insert language shall be identifying a future status of these wells e.g., *decommissioning*.

The following text has been added to the end of this bullet "At future date, these removed wells may be considered for either decommissioning or well deepening."

Section 1.2, page 1-3, Bullet 7, sentence 2
"The need for modifications to the network will be assessed at that time" is vague and does not denote any further action to be taken such as construction of a new monitoring well or deepening of an existing well. A more concrete assumption would be that if wells cannot be sampled prior to the next CERCLA 5-year ROD review, then . . ." That leaves an over-all re-evaluation for the 5-year ROD review, and leaves re-evaluation of individual wells within the scope of this DQO.

Bullet has been revised as follows:

- **"If one or more wells within the 200-ZP-1 or 200-UP-1 OUs become(s) unsamplable after the final monitoring network has been established, it may either be replaced by another nearby existing well, or plans will be made to either deepen the existing well or install a new well."**

Section 1.2, page 1-3, Bullet 8
Dissolved plumes vary in space and time and rarely are there steady state; therefore, "will be assessed" does not denote any action. It would be more concrete to tie the assessment to a substantive product like the annual groundwater monitoring report.

Bullet has been revised as follows: "Appendix B of this DQO establishes an initial frequency of sampling for the 200-ZP-1 and 200-UP-1 groundwater monitoring network. This frequency will be re-assessed on an annual basis and adjustments made as needed."

Section 1.2, page 1-3, Bullet 9
Does "maximize the use of existing monitoring wells," mean retrofitting? Identify what is the concept of maximize.

No. The process of maximizing the use of existing wells is clarified as follows:

1) **Initially all of the dry wells, wells of poor construction, and wells of unknown construction were removed from the 200-ZP-1 and 200-UP-1 OUs.**
2) **The most recent sampling results from this refined list of wells was used as input for PNNL's vario-gram analysis.**
3) **At the completion of the vario-gram analysis, stochastic simulation was used to produce 100 equi-probable realizations of the contaminant plume distribution.**
4) **The median of these realizations and the uncertainties calculated from these realizations provided a basis for evaluating the "value" of each well in the network.**
5) **An algorithm was then used to rank each well in the network relative to its importance in the network.**
6) **Wells with relatively "low" importance were removed from the network.**
7) **The network was then further refined using hydrogeologic expertise and taking into consideration the goals of the groundwater remediation performance and site-wide surveillance monitoring programs.**
8) **New wells where then proposed for those areas where there is no adequate well coverage from existing wells.**

Section 1.2, page 1-3, Bullet 11
In what document or under which regulatory framework will the effectiveness of the the 200-UP-1 pump-and-treat system be addressed (reference to that evaluation should be stated here). Due to uncertainties in subsurface characterization, the 200-UP-1 pump-and-treat system may require periodic review and modification of the design, construction, maintenance, and operations.

Bullet has been revised as follows: "The monitoring well network resulting from this DQO process will be re-evaluated on an annual basis to ensure that it continues to provide the data needed to track the performance of the pump-and-treat systems (as required by EPA et al. 1995 and EPA et al. 1997), and to perform the surveillance monitoring of groundwater

contaminant plumes (as required by DOE Orders)." The review and modification of 200-UP-1 pump-and-treat system is beyond the scope of this DQO.

Section 1.3
No Comment

Section 1.4
No Comment

Section 1.5.2, page 1-8, paragraph 7
How do these contaminant mass removal amounts compared to known source zones, i., e. (inventory)?

Section 1.5.2 has been expanded to note: "DOE-RL 1997 reports that between 1951 and 1968, a total of 12.1 million gallons of 216-U-1/2 waste water was released to the 200-UP-1 OU. This waste water is estimated to have contained approximately 0.35 pounds of technetium-99, and 290 pounds of uranium."

Section 1.6
No Comment

Section 1.7
No Comment

Section 1.8
No Comment

Section 1.9
No Comment

Section 1.10
No Comment

Section 1.11
No Comment

Section 1.12
No Comment

Section 1.13
The problem statement indicates that the problem is a change in the shape and concentration of the COC plumes within the 200-UP-1 OU. Therefore, the network of wells needs to be reassessed to determine "if they are still appropriate". The language in the document is ambiguous; a better wording

would be "if they still support the decision in this DQO.". Over 4 wells in the network have already gone dry and/or will go dry (W-19-28, W-19-24, W-19-25, W-19-19). How will this be addressed?

Second sentence of the problem statement has been re-written as follows: "Therefore, the network of wells used to monitor the OUs, the sampling frequency, and the analytical methods need to be reassessed to determine if they are appropriate to meet the needs of both the remediation performance monitoring and Site-wide surveillance monitoring programs." Note that Step 2.0 of the DQO process identifies the specific decisions that need to be resolved.

Section 2.0
No Comment

Section 3.0
No Comment

Section 4.0
No Comment

Section 5
No Comment

Section 6
No Comment

Section 7
No Comment